

NESTAR SYSTEMS, INCORPORATED
CLUSTER/ONE MODEL A
NETWORK SUPPORT PROGRAMS

PRINTER SPOOLER

Version 1.0, August, 1980
(C) 1980 Nestar Systems, Incorporated

DESCRIPTION

A major advantage of the Cluster/One Model A is that the Apple computers on the network can share expensive resources such as a printer and at the same time retain their full power as independent computers. The Pascal Printer Spooler package allows an Apple computer station to act as a printer-server, queueing the names, locations, and print options of Pascal files to be printed, then printing each file in the order in which the requests are received. Users at Pascal-capable user-stations can name files they wish printed, request information about running the spooler, or request a listing of the queue of files waiting to be printed. Users may specify print options for page titles, form-feed insertion, and the number of copies.

Component Programs

The Printer Spooler package consists of text and code files for three programs: (1) the printer spooler, which runs on a dedicated printer-server Apple; (2) the print request program, which can be executed from any Pascal user-station; and (3) an initialization program which creates and initializes two files, PRINTQ and STATUSQ, which contain the list of files to be printed.

The Print Request program resides on the virtual diskette called /MAIN/PASCAL/LIB which is automatically mounted on drive 5 whenever a Pascal-type virtual diskette is booted. It is executed at the Pascal command level by typing X Pascal:print (or X #5:print).

All other elements of the Print Spooler package reside on a virtual diskette called /MAIN/USERS/PRINTER. Its Pascal volume name is PRINTQ.

The text and code files on /MAIN/USERS/PRINTER are called:

```
PRINTQ:PRINT.SPLR.TEXT
PRINTQ:PRINT.SPLR.CODE
PRINTQ:PRINT.RQST.TEXT
PRINTQ:PRINT.INIT.TEXT
PRINTQ:PRINT.INIT.CODE
```

After PRINTQ:PRINT.INIT.CODE has been run to create the PRINTQ:PRINTQ and PRINTQ:STATUSQ files, the name of PRINTQ:PRINT.SPLR.CODE should be changed to PRINTQ:SYSTEM.STARTUP so that it will be executed automatically when /MAIN/USERS/PRINTER is booted. The spooler will not run properly until the PRINTQ and STATUSQ files are created.

Queue Files and Locks

When created, the two files, PRINTQ and STATUSQ, must reside on /MAIN/USERS/PRINTER. They contain information on the last 152 print requests. PRINTQ is 19 blocks long and contains the pathname, filename and print options for each print request. STATUSQ is one block long and contains the status of each request:

```
WAITING
PRINTING
FINISHED
FILE NOT FOUND
DISK NOT FOUND
CRASHED
ABORTED
```

Entry 0 of STATUSQ points to the next entry to be processed. Locks, also called PRINTQ and STATUSQ, are set for exclusive use so that only one user at a time can update the files.

Customizing the Spooler Program for Different Printers

The spooler program included in this package is known to operate with either a TTY-40 or a Qume printer. Both these printers require an Apple serial interface card in expansion slot 1. The TTY-40 printer requires that the switches on the serial card be set:

```
1 ON
3 OFF
```

The Qume printer requires that the switches be set:

1 OFF
3 ON

Follow the instructions given with the serial interface card and the particular printer to connect the printer-server Apple to the printer.

For other makes of printers, it may be necessary to also change the hardware-dependent code in the spooler program. This section of the code is listed here to facilitate modification.

PROCEDURE PRINTCHAR (S:CHAR);

TYPE

BYTE = PACKED ARRAY[0..0] OF CHAR;
TRIX = PACKED RECORD CASE INTEGER OF
0: (ADR: INTEGER);
1: (PTR: ↑BYTE)
END;

VAR I:

TRIX;

BEGIN

I.ADR:=-16240; (* WHICH IS \$C090, SERIAL CARD INPUT *)
WHILE ORD (I.PTR↑[0]) > 127 DO ;
(* WAIT UNTIL PRINTER READY *)
UNITWRITE(6,S,1)
END; {PRINTCHAR}

OPERATING INSTRUCTIONS

NOTE: Either upper or lower case characters may be used in responding to prompts from printer programs. They are equivalent.

Initialization

1. Boot /MAIN/USERS/PRINTER

2. At Pascal command level, X(ecute:

PRINTQ:PRINT.INIT

3. Program will display:

Available virtual drive:

4. Respond with 4 followed by <return>.

5. At end of program, control returns to the Pascal command level.
6. Enter filer by typing F.
7. Change name of spooler program by typing

C PRINTQ:PRINT.SPLR.CODE,SYSTEM.STARTUP

Printer Spooler

1. Insert Apple serial interface card in expansion slot 1 of printer-server Apple.
2. Boot /MAIN/USERS/PRINTER at printer-server.
3. The program will display:

NETWORK PRINTER SPOOLER--

MOUNTS /MAIN/USERS/PRINTER ON D4
 TYPING "A" ABORTS CURRENT LISTING
 "Q" QUILTS THE SPOOLER
 "C" MAKES IT WAKE UP

READY. . .

Then as each file is printed, its name and the pathname of the virtual diskette on which it is located are displayed on the printer-server's screen. When a request has been processed, its status (such as FINISHED or FILE NOT FOUND) is displayed on the following line. The screen scrolls as new files are added.

The spooler examines the STATUSQ file approximately every 38 seconds to see whether there is a request waiting. Typing C at the printer-server causes the spooler to examine the queue immediately.

If the printer-server, disk, or file-server stops operating while a file is being printed, the status of that print-request is "CRASHED," and the request must be re-entered. If this occurs, the printer-server when it resumes operation, will display the message:

CRASHED WHILE PRINTING LAST FILE

Print Request Program

NOTE: The virtual diskette containing the file to be printed must be either unmounted or mounted for shared use. The virtual diskette must have R (read) as one of its public

access rights; (this is a default if no PUBACC is specified when the virtual diskette is created).

1. Boot a Pascal-type virtual diskette.
2. At Pascal command line, X(ecute:

PASCAL:PRINT

3. Program will display:

Network Print Program-

Available Virtual Drive:

4. Respond 4, 5, 9, 10, 11, or 12 followed by <return>.

NOTE: You shouldn't use drive 4 (which contains the booted virtual diskette) or drive 5 (which contains /MAIN/PASCAL/LIB) because then you will lose the system. Drives 9, 10, 11 and 12 can be used if they are virtual. Drives 9 and 10 are virtual if there is no disk control card in slot 4, or if the Cluster command SET D9,V has been issued. Similarly, drives 11 and 12 are virtual if there is no disk control card in slot 5, or if the Cluster command SET D11,V has been issued.

5. Program will display:

List, Print, Help, or Quit (l/p/h/q)?

6. If you type p, the program displays:

Volume Name:

7. Type full name of virtual diskette containing file to be printed--e.g. /main/users/nss/2. PRINT does not know about the default directory specified by SET DIR.

8. Program will display:

Pascal File Name:

9. Type name of file. It is not necessary to include the suffix ".text".

10. Program will display:

Options (cr/y/n)?

11. Type y if you want new options, n if you want no options, and <return> if you want the same options you previously requested.
12. If you respond y, the program displays each option:
 - page titles and formfeed insertion (y/n)?
 - formfeed insertion only (y/n)?
 - number of copies=1 (cr/number)?
13. Respond y or n to the first 2 questions. If the desired number of copies is displayed, press <return>; if not, enter the number you desire followed by <return>.
14. Program will then ask:
 - Is this correct (y/n/esc)?
15. Type y to print. Type n to cycle through the print parameters you gave so that you can press <return> for the parts that are correct and change the parts in error. Press <esc> to return to the L(list, P(rint, H(elp or Q(uit option without printing.
16. If you type L at step 5 to L(list the print queue, the program will display:
 - Number of completed entries: 10 (cr/new response)?
17. To list 10 completed entries, press <return>. To list n entries, type n <return>.
18. The program will list, for each of the last n requests, its pathname, filename, and status.
19. If you type H at step 5 to request H(elp, the program will display:

PRINT allows a user to list the print queue or to print out a Pascal file on a virtual network disk. PRINT asks for an available virtual drive that it can use for mounting the network disk '/MAIN/USERS/PRINTER'.

The user is expected to leave the disk containing the file to be printed unmounted or mounted on a shared basis. The printer output will reflect the state of the file at the time it is printed, not at the time the print command is issued.

PRINT

20. If you type Q at step 5 to Q(uit, control will return to the Pascal command level.